Diathermy
in
Genito-Urinary Diseases

Medical—Surgical

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Diathermy in Genito-Urinary Diseases

The Treatment of Tumors of the Bladder by Means of Surgical Diathermy. Abraham G. Fleischman, M. D., Des Moines, *The Journal of the Iowa State Medical Society*, January, 1928. Page 1.

This author says in conclusion that "I firmly believe the surgical diathermy as outlined in this communication is by all means the method par excellence for the treatment of neoplastic diseases of the bladder; and, in my opinion, is immeasurably superior to any other method in vogue at the present time. I would advise the members of the profession who are interested in the therapy of this important malady to acquaint themselves with the method of surgical diathermy in order that they may use it intelligently and thereby secure a maximum amount of benefit to the patient."

The Treatment of Bladder Tumors. By Wilbur H. Haines, M. D., Philadelphia, in *Pennsylvania M. J.*, xxxii:6:405, March, 1929.

The author makes the following enumerations in his Conclusions:

1. A definite and satisfactory plan of therapy can be attained only by a simple uniform classification of tumors and the submission of each type to one line of therapy, with careful checking of results.

2. The trained and experienced cystoscopist, well informed as to clinical benignity and malignancy, is the proper person to determine the therapeutic measures desirable.

3. Endovesical fulguration, preceded by X-ray therapy, is the best treatment for papillomata and early papillary carcinoma without evidence of infiltration, uncomplicated by an intractible cystitis. When in doubt, this form of therapy is worth a trial.

4. When definite evidence of infiltration exists, when the tumor is favorably situated and does not involve ureteral transplantation, and when the subject is a good operative risk, resection preceded by X-ray therapy is recommended. While ureteral transplantation and total extirpation have been performed successfully, it is rarely justifiable.

5. In inoperable tumors, X-ray therapy, followed by intensive diathermy by cystotomy, is a conscientious effort to prolong life.

Present Day Status of Physical Methods in Surgical Diseases. Gustavus M. Blech, M. D., *Archives of Physical Therapy, X-Ray, Radium*, Vol. IX, No. 7, July, 1928. Page 289. (Read at the sixth annual meeting of the American College of Physical Therapy, Chicago, Nov. 3, 1927.)

"In gynecology electrocoagulation is the method of choice for the removal of urethral caruncles. * * *

"We have had excellent results in the treatment of fissures of the rectum. * * *

"Theoretically, as well as practically, hemorrhoids of all sorts can be treated successfully by electrocoagulation under infiltration analgesia. The results are far superior to those attained by the old clamp and cautery method, for the heat does not radiate to distant structures as is the case with the red hot iron or the galvanocautery. We make one exception and that is in thrombotic hemorrhoids, when opening of the growth and expression of the clots is the logical procedure. * * *"

Selected Surgical Procedures with Surgical Diathermy. By Grant Eben Ward, M. D., Baltimore, Md., in *Arch. Physical Therapy*, Vol. IX, No. 10, October, 1928. Page 434.

Under Hemorrhoids the author says:

"Here we find one of the most strikingly useful fields. The advantages of this method over the usual type of hemorrhoidectomy are:

"1. A practically bloodless and therefore rapid and simple operation.

"2. The post-operative course is smooth, there being as a rule little pain, and practically no swelling.

"3. In many cases it is an office procedure.

"Anesthetic.—One or two percent novocain solution is injected subcutaneously around the anus and then deeply under the sphincters on all sides, as high as the hemorrhoids extend.

"Technic.—After thorough dilation of the sphincter allowing adequate exposure, the hemorrhoid is grasped with any suitable clamp. This causes stasis of the contained blood, making coagulation possible, which is accomplished by inserting a needle electrode held in suitable handle and carrying a strong monopolar desiccating current into the vessel, allowing it to remain until the blood has coagulated and the intima has been destroyed. The clamp may then be removed without disturbing the contents of the vein. I prefer to open and remove the clot, allowing free drainage for any possible infection.

"I use a modification of this technic preferring the smoother, quicker active bipolar coagulating current. After coagulating the hemorrhoid beyond the clamp the active electrode is applied directly to the hemostat, the current flowing down it to the tissues held within its grasp. These tissues are then fused by the current. One must not allow deep penetration into the lateral structures giving a large post-operative slough."

Electrocoagulation Treatment of Inoperable New Growths. By H. von Seemen in *Deutsch. Zeitschr. f. Chirurg.*, 220:109, Sept., 1929.

Abst. in Jour. A. M. A., 91:25:2009, December 21, 1929.

Although there are slight objections to the use of this method of treatment in these cases, von Seemen is convinced that the advantages greatly exceed the disadvantages. There is but little hemorrhage, and only slight shock; sterilization is effected; blood and lymph vessels are occluded; the formation of granulation tissue is favored; the patient recovers rapidly from the effects of the operation; there is only slight pain and the psychic effect is good.

Regeneration of the Bladder Following Resection. Herman L. Kretschmer, M. D., and K. E. Barber, M. D., Chicago, *Journal Am. Med. Assn.*, February 4, 1928. Page 355.

Abstract of Discussion

Dr. George A. Wyeth, New York: Dr. William J. Mayo has pointed out that only particles of molecule size, such as sugar, the amino acids and other crystalloids, are absorbed directly into the blood capillaries of the body, while the colloids and particles of larger size are taken up by the lymphatics. He says that bacteria and malignant cells do not pass directly into the capillaries but are carried by phagocytes into the lymphatics, which are a closed system of vessels. To emphasize this point is to emphasize the danger of dissemination that lies in the severance of these lymphatics when using the scalpel, and the advantage which inheres in a method that seals these lymphatics, instead of opening them. This is best performed by the endotherm knife or cutting current. Since its perfection we have discontinued the use of the scalpel in the treatment of malignant conditions. We believe that endothermy will do all that the scalpel will do and with more lasting benefit. The mistake most genito-urinary men are making with electrothermic methods is in not using them until other methods have failed, and then, as a last resort, produce too widespread, needless destruction by uncontrolled dosage, the effect of which is often disastrous and is always caused by the use of the blunt electrode. A large area of coagulation necrosis naturally results with its consequent toxemia, for which the doctor has just prescribed but which should never have happened. It is always the result of faulty technic. Drs. Cunningham, Graves and Bovie have worked out a method of measuring by thermocouples the amount of heat induced in the tissues (not in the applicator) at the time of applying diathermy. This is important. Repeated attempts to fulgurate a benign tumor are all wrong. This is not endothermy. If we expect to destroy a tumor we should go after the growth there and then and destroy it and remove it. I have learned that underdosage with these currents is just as bad as underdosage with radium, and we shall not get results unless we use the current properly.

Dr. B. C. Corbus, Chicago: * * * Recently, we have come into the possession of a diathermy cystoscope, which utilizes the shaft of the cystoscope as the active electrode. We have found this method to be far superior to any electrode that we could use through the ordinary operating cystoscope.

Dr. D. N. Eisendrath, Chicago: * * * In Chicago we are using diathermy in carcinoma of the bladder much more frequently than radium and are much pleased with the results. We are waiting until five years have passed before we say much about it, but from the immediate results in a large series of cases, we are

pleased and hopeful. I think that Dr. Wyeth is making a mistake in saying that we are trying to use a desiccating current.

Dr. Bransford Lewis, St. Louis: * * * In reference to diathermy and radium, there is a place for both these methods. If a large tumor is recognized as carcinoma, one should not use radium alone in that case. I would expect to remove the gross portion of the tumor by means of the cautery knife, then use diathermy and get all the effect I could; then, after a month or so, perhaps, make an implantation of radium seeds, dependent on the progress of the case.

Dr. E. A. Thomas, Philadelphia: Papillary carcinomas are of two types: (a) those exhibiting carcinomatous degeneration of their papillary surface, but possessed of a benign pedicle, and (b) those with a carcinomatous pedicle involving the bladder wall. The former respond to treatment admirably and are curable even by cystoscopic fulguration; the latter must be classed with infiltrating carcinomas in general. They should never be treated by fulguration, if the growth can be excised radically, and obviously, the results, comparatively, are poor. * * * In two or three cases, the patient's death was undoubtedly hastened, I believe, by the implantation of radium needles, which precipitated metastasis to the lymphatics and bones. For the last three years, we have not supplemented diathermy by any implantation of radium, and I am positively convinced that our results have been better than when we employed massive doses of radium by needle implantation, supplementing thorough destruction of the tumor mass by fulguration.

The Treatment of Tumors of the Urinary Bladder. H. Wade, *Edinburgh M. J.*, 1927, xxxiv, Med.-Chir. Soc. Edinburgh, 1; Abts. Surg., Gyn. and Obst. (July, 1927).

The author discusses the nature of bladder tumors in general, emphasizes the tendency of such neoplasms to cause early sudden haemorrhage, and reviews in some detail the various methods of treatment. * * *

The treatment of tumors of the bladder is determined by the nature, size, spread, and dissemination of the growth. For the benign villous papilloma the best treatment is fulguration. A number of such treatments at intervals of two weeks may be necessary to destroy the tumor completely. If a tumor of this type is too large for fulguration, a suprapubic cystotomy with removal of the neoplasm must be done. In this operation great care must be taken to prevent the implantation of tumor cells in the region of the bladder wound. For a year after the operation the author subjects his patients to frequent cystoscopic examinations in order that he may be able to fulgurate any daughter tumors that may appear.

Malignant papillomatous borderline tumors should not be fulgurated; the best results are obtained with radium.

In cases of primary carcinoma of the bladder the treatment to be given depends upon the situation and extent of the growth. In many cases partial cystectomy may be done successfully. In advanced cases, the pain may be relieved by total cystectomy.

Results Obtained by Various Methods of Treatment in 622 Cases of Bladder Tumors. Scott and McKay, *New York State Journal of Medicine*, Sept. 1, 1927. Page 949.

"The essential factor in the treatment of bladder tumors is their proper classification as to the type of growth. * * *

"The tumor having been properly classified, it is not, as a rule, difficult to select the most appropriate form of therapy.

"Benign papillomas always respond to fulguration alone, but these tumors often disappear much more rapidly when cystoscopic applications of radium are used in addition to fulguration. These tumors recur, and often it is necessary to have the patients return from time to time for cystoscopic examination over a period of several years after the primary growth has been destroyed.

"Malignant papillomas very frequently respond to fulguration alone, but much more satisfactory results are obtained if the tumor is first thoroughly treated by cystoscopic applications of radium and then fulgurated. These tumors recur more frequently than the benign type and this necessitates the patient's return for cystoscopic examination at intervals of every few months.

"Papillary carcinomas, if not too extensive, usually respond to radiation plus fulguration, and should first be subjected to this

combined therapy. In a few cases where this therapy has failed the tumor has responded to X-ray. Should the methods mentioned above fail, the tumor should be resected if it is a favorable location for such a procedure. If its location is unfavorable, it should be cauterized superficially and implanted with radium or treated with deep diathermy. * * *

"The value of diathermy as a therapeutic measure in the treatment of infiltrating carcinomas of the bladder has not as yet been definitely established."

Results in the Treatment of Cancer of the Bladder. Vincent J. O'Conor, M. D., Chicago, *Illinois Medical Journal*, November, 1927. Page 369.

This author says in conclusion that "fifty patients with carcinoma of the urinary bladder have been carefully studied and followed clinically over a period of eight years.

"While the number of patients is not large, the series is rather typical of all groups of these cases. Only one method of treatment was used in the management of these patients. Thorough, slow, deep electro-coagulation commonly known as *diathermy*.

"There were four immediate operative deaths—a mortality of 8 per cent.

"Twenty patients are living and well without evidence of recurrence after periods varying from one to eight years. An ultimate clinical success, at least for the time being, in forty per cent of the patients.

"We believe that diathermy offers a more satisfactory means of combating malignancy of the bladder than any other therapeutic procedure, not only for relieving the patient symptomatically and prolonging his life, but with a definitely measured hope of complete cure in a large percentage of cases."

Bladder Tumors: Removal with Fulguration. Otto J. Wilhelmi, M. D., St. Louis, *Missouri Medical Association Journal*, May, 1928. Page 199.

This author says that "the following advantages of fulguration over suprapubic surgery may be cited: (1) Easy application of fulguration; (2) no confinement to bed after treatment, and rapid recovery; (3) very small possibility of bladder or kidney infections after treatment; (4) local urethral anesthesia; (5) that 95 per cent of benign papillomata and 65 per cent of papillary carcinomata can be destroyed by fulguration; (6) the possibility of recurrence in other parts of the bladder is diminished."

Physical Agents in Treatment of Bladder Tumors. E. Beer, New York, *American Journal of Surgery*, New York, February, 1928. Abst. J. Am. Med. Assn. (April 14, 1928). Page 1248.

Beer reviews his experience in the treatment of more than 400 bladder tumors with physical agents, such as: (1) various modalities of the high frequency currents through the cystoscope; (2) use of these currents through the opened bladder combined with alcohol to prevent implantations; (3) resections of the bladder with the radio-knife actuated by a very rapidly oscillating (1,200,000) high frequency current; (4) use of radium seeds (emanations)—(a) through the cystoscope; (b) through the open bladder, and (5) deep roentgenotherapy. It is evident that the results accruing from the use of these agents are steadily getting better, thus warranting their use.

Bladder Tumors. J. C. Negley, M. D., Los Angeles, *California and Western Medicine*, March, 1928. Page 145.

This author says that the "methods of treatment in this series of cases at least seem to favor fulguration or surgical diathermy, either through a closed or open bladder. All of those having cystoscopic fulguration, to say the least, had less discomfort and loss of time than those having x-ray or treatment through the open bladder.

"My observation has been that a large size and apparent malignancy should not deter one from using fulguration through cystoscope, for many of those here recorded had reached generous size. Surgical diathermy through the open bladder causes the patient comparatively little discomfort and pain. There seems to be only slight tendency to fibrosis, thus making the dreaded hydronephrosis a less frequent complication."

Prostatitis. *Journal American Medical Association*, October 10, 1925. Page 1155.

Replying to a query by a correspondent, the *Journal* states, "Diathermy furnishes excellent results in cases of chronic prostatitis."

Diathermy for Prostatitis. *Letter to the Editor of Jour. A. M. A.*, 92:25:2124-5: June 22, 1929.

To the Editor—1. What is the value of diathermy in treating chronic prostatitis and seminal vesiculitis of ten years' duration? 2. At what intervals and for what periods of time should the treatments be administered? 3. Should the treatments temporarily aggravate a coexisting auricular fibrillation? 4. What type of apparatus and what type of rectal electrode are best suited for the treatment of these conditions? Please omit name,

M.D., Philadelphia.

Answer.—1. Medical diathermy, the heating within physiological limits of tissues by means of high frequency currents, is a valuable aid in treating chronic prostatitis and vesiculitis. 2. The sequence of the treatments is mainly determined by the tolerance of the rectum, which, however, rises in the course of application. As a rule, treatments administered every other day are well borne. It is important to evacuate the bladder and rectum previous to the diathermic application. The rectum is best cleansed by an oil enema. At first the treatment is continued until the patient reports spasmodic contractions within the lower pelvis. After a better tolerance is once established the minimum duration of each sitting should be 30 minutes, which period later on is extended to one hour. Each treatment is started with a minimum of current, the magnitude of which is gradually increased until the patient reports a pronounced sensation of warmth within the rectum. The report of feeling distinct heat calls for reduction of the current to the level indicated.

3. Moderate treatments have no undesirable effects on the cardiac action.

4. Any standardized prostatic electrode and diathermy apparatus will answer the purpose.

Prostatitis—Treatment by Diathermy. By Owsley Grant, Louisville, Ky., in *Archives Physical Therapy*, 10:9:408: Sept., 1929.

Only two points have come to our attention to contraindicate diathermy. One is the possibility of burn, or injury to rectal tissue. We have never seen incidence of this though we are always exremely careful in manipulating these cases. We use no rectal thermometer, believing that the patient's sensation is sufficient guide and alarm. The other point is, does diathermic heat in the prostate increase the likelihood of epididymitis? We have thought that it did in subacute prostatitis though only the ordinary clinical observation substantiates us.

Our chief contribution is the realization that patients with hidden foci of infection may show only very slight or no signs of prostatic involvement in the urine or prostatic secretion, yet with their aching joints and neuralgia is a sense of fulness in the perineum and inguinal discomfort. These patients after treatment by diathermy express increasing amounts of pus from the prostate, the remote symptoms of infection are temporarily aggravated and then as the flow of pus increases the symptoms improve.

The ordinary forms of prostatitis are as well treated without diathermy as with it after the flow through the ducts has begun.

In acute cases diathermy is undoubtedly dangerous.

Use of High Frequency Currents in Treatment of Prostatic Disturbances. By G. Arnold, in *Bull. et mem. de la Soc. des Chir.*, 21:89: Feb. 1, 1929.

Abst. Jour. A. M. A., 92:16:1391: April 20, 1929.

Arnold reports a case of adenoma of the prostate in a man, aged 58, who had considerable pollakiuria, severe pains on urination, 75 cc. of residal urine, and fever and was in poor general condition. He was completely cured by two treatments of electrocoagulation applied to the prostate through the urethra. In all cases of urinary disturbances caused by small hard sclerous prostates or by medium sized or by partial (median part especially) hypertrophy of the prostate, the author uses high frequency currents for boring into the prostate through the urethra or transvesically, after a suprapubic cystotomy. In the cases of large prostates he performs prostatectomy.

Gonorrheal Posterior Urethritis: Diathermy. By William Bierman M. D., New York, in *Physical Therapeutics*, 47:2:58: February, 1929.

I applied diathermy to the posterior urethra by means of a rectal electrode and a suprapubic electrode, changing to the belt electrode. It has been my experience in general that in the treatment of the prostate by means of diathermy the clinical results I obtain seem to be somewhat better where the belt electrode is used rather than the suprapubic electrode.

These treatments were applied twice a day. The treatments endured from one-half to one and a half hours each. I used sufficient current, as I do in general diathermy, to reach the point of comfortable heat tolerance. In this instance that amounted to about 1000 ma. as judged by the ordinary hot wire milliamperemeter. At the end of a week the symptoms of acute posterior urethritis disappeared and the second urine specimen became absolutely clear.

Gynecology. Howard A. Kelly, A. B., M. D., LL. D., and collaborators. Pub. by D. Appleton & Co., 1928. Chapter 48. Pages 974-994.

Under the title of "Electrothermy" Dr. Grant E. Ward says:

"High frequency electric currents are finding a definite place in medical and surgical gynecology, coordinate with a larger field in general surgery.

"The concentrated current sterilizes the adjacent tissues but contamination may come from handles and wires leading to the electrode unless carefully sterilized by boiling or soaking in carbolic acid and alcohol.

"*Histology.* Desiccation (monopolar current) dehydrates and reduces the tissues to a dry whitish material, under the microscope. The bipolar current coagulates the cell proteins into a homogeneous mass, the connective-tissue stroma being converted into an eosin-staining hyaline material and the blood-vessels being filled with clotted blood, often with walls destroyed and included in the structureless mass.

"Infection of Skene's and Bartholin's Glands—A fine needle used as the active electrode is inserted into the gland and a weak current turned on and continued until the surrounding tissues are whitened and dried.

"Nonspecific infectious diseases—Chronic and Cystic, Cervicitis—Can be treated by bipolar electrothermy, the active needle electrode being thrust into the cervix at various points until the diseased area is thoroughly coagulated.

"Pruritus—The active pointed monopolar electrode is played over the surface until it presents a white desiccated appearance.

"Chancroid; Venereal Warts; Veruca Acuminata—Desiccating current.

"New Growths—Benign tumors yield quickly to desiccation or coagulation with a resultant soft pliable scar. * * *

"Cervix Uteri—Papilloma—The Vagina—Using a hard rubber speculum * * * with the active electrode carrying a coagulating current. * * *

"Urethra—Caruncle—Including prolapse of Mucosa and Granuloma—The first rare and the latter rather common maladies are best treated by the monopolar high frequency current applied either with a fine or a blunt electrode.

"Polyps—Polyps at the external meatus are removable by using a clamp as the active electrode.

"Bladder—Electrothermic methods in gynecology here find one of their most interesting and often brilliant fields.

"Ulcer—The results in the diathermy treatment of bladder ulcers are so gratifying and the technique so simple, that the current is quickly applied with little discomfort and no anesthesia. A monopolar (desiccating) current of fairly high amperage is applied by a long, well-insulated electrode inserted through an open-air cystoscope with the patient in the knee-chest posture.

"Coagulation of inoperable metastatic glands in situ offers one of the great opportunities in cancer surgery."

Clinical End Results Following Diathermy in Gynecologic Conditions. Mortimer N. Hyams, M. D., New York, *American Journal of Obstetrics and Gynecology*, February, 1928. Page 224.

The author in pointing out that there has been greater progress in surgical diathermy than in medical diathermy says that "many clinicians do not have the time, patience or inclination to apply the slower modality with the necessary persistence and attention to detail so that cures are sometimes reported on insufficient evidence. * * * On the other hand, some gynecologists can see no merit, present or future, in medical diathermy. Reckless statements emanating from either the over-enthusiast or the nihilist are a detriment to clinical progress. * * *

"Diathermy should not be regarded as a cure-all. If used properly in selected cases, particularly in combination with other therapeutic agents, it is certainly of great value."

"Condylomata—Eighteen such cases have been treated with perfect results.

"Skene's Gland Infections—Sixteen cases have been cured with diathermy.

"Bartholin's Gland Infections—Prefers surgical incision."

Medical Diathermy in Urology—Analysis of End Results During Seven Years. By Vincent J. O'Conor, M. D., Chicago, in *Illinois Med. J.*, 56:163-166: Sept., 1929.

Acute Anterior Urethritis—No satisfactory method for treating infections of the male urethra with diathermy.

Periurethritis—In none of these had suppuration taken place before diathermy was started. Urethral treatment was stopped and by means of through and through diathermy the infected area was subjected to one or two hours heat induction a day. Hot applications and hot soaks were advised in conjunction with the above. In over 50 per cent of these individuals the infected follicles soon became soft and established drainage through the urethral lumen.

Stricture of the male urethra—While diathermy is theoretically of great value in hastening the dilatation of the more dense scars, here again we have found but a scant use for this method.

Aberrant urethral glands harboring the gonococcus—These are easily destroyed by the fine wire active electrode introduced to their depths so that complete coagulation of the epithelial structures results.

Gonorrheal prostatitis, prostatic abscess and seminal vesiculitis—In the instance where drainage has become markedly interfered with and prostatic abscess is impending, we have found the application of rectal diathermy of greatest value. * * * Of 17 recorded instances of early prostatic abscess, or "impending" abcess, 13 subsided rapidly after rectal diathermy.

Epididymitis—In gonorrheal epididymitis we find the greatest and most consistently valuable use of medical diathermy.

Gonorrheal arthritis—Arthritis of gonorrheal origin is very markedly benefited by through and through diathermy of the inflamed joint.

Gonorrheal urethritis—In 91 instances of acute gonorrhea in the female where no evidence of paraurethral infection existed at the time, only three developed this complication later on.

Gonorrheal endocervicitis—215 women have been treated prior to May, 1927, by endocervical diathermy. 38 have had additional cauterization of cervical glands and follicles. Of this number, 85 have been checked for more than three years and 42 for more than two years. The remainder were not seen after the cessation of active treatment.

Infection of Skene's or Bartholin's glands—In the majority of instances drainage and later excision of the gland is most satisfactory.

Gonorrheal Salpingitis—In the acute stages of tubal infection with pelvic pain, elevation of temperature and leucocytosis, it is generally agreed that palliative treatment is advisable unless gross suppuration occurs. Through and through diathermy has been a very valuable additional palliative measure at this time.

Small Fistulas of Bladder: Treatment by Means of Electrocoagulation. *Zentralbl. f. Gynack.*, 54:1093, May 3, 1930. Abst. in Jour. A. M. A., 95:5:381, August 2, 1930.

Ottow, who for several years has used electrocoagulation in the treatment of small fistulas of the bladder, stresses the importance

of placing the bladder at rest, following the operation, by means of a retention catheter. Keeping the bladder completely collapsed permits the edges of the wound to be brought together and held in place. This greatly facilitates the healing. The catheter is left in the bladder for about ten days.

A New Method for the Treatment of Stricture of the Urethra. Geo. R. Livermore, M. D., in *South M. J.*, XXIII:9:849, September, 1930.

The electrode is applied to the stricture through the urethroscope, the bipolar current turned on and the strictured band or bands thoroughly fulgurated.

In a week or ten days sounds are passed and one will be surprised at the ease with which a sound (larger than one which had passed with difficulty before fulguration) will then slide on through the stricture.

Diathermy in Gonorrhea. By Dr. Leo. L. Michel, New York, *M. J. & Record*, January 18, 1928.

With diathermy, the author states, he has not had uniformly successful results in anterior gonorrheal urethritis. Abortive therapy has been aided. In the involvement of the posterior urethra, prostate and seminal vesicles, either acute or chronic, diathermy has given actual brilliant results, surpassing those of any other form of treatment known to the author. Since using diathermy there has been little occasion to resort to surgical intervention in posterior gonorrhea.

In cases of gonorrhea of the female tract, the author has been able to do more with diathermy than he could do formerly with other methods.

Electrodiathermy—Its Use in the Treatment of Benign and Malignant Lesions of the Uterine Cervix. Frank M. Mikels, M. D., Long Beach. *California and Western Medicine*, January, 1928. Page 67.

This author says in conclusion that "electrodiathermic treatment of lesions of the uterine cervix is more efficacious than topical medical applications.

"Electrothermic treatments of cervical lesions are more conservative than any of the surgical operations when it is feasible to apply these methods.

"Electrodiathermic treatment of lesions of the uterine cervix does not interfere in any way with successful plastic operations for the repair of extensive lacerations, but leaves a clearer and cleaner field for these procedures.

"Electrodiathermic treatment of cervical erosions and the adjacent inflammatory tissue do not impair the sphincter action of the musculature of the uterine cervix nor interfere with its normal distensibility during parturition.

"Electrodiathermy should receive the careful consideration and respectful recognition of all obstetricians and gynecologists who are interested in conserving the function of this generative organ, and in preventing the occurrence of cancer of the cervix."

Endothermy in Gynecology. Howard A. Kelly, M. D., Baltimore, *Journal Am. Med. Assn.*, September 24, 1927. Page 1028.

INDICATIONS

"(1) Cleaning up cancerous cervix either before inserting radium or before operation.

"(2) In exsecting a carcinoma of the vulva of whatever extent.

"(3) In destroying granuloma of the urethra and true caruncle. * * *

"(4) Bartholin's cyst or abscess: in destroying intra-abdominal, infected areas on the pelvic walls.

"(5) Localized pruritus by destroying the superficial layers of skin or mucosa. * * *

"(6) Cervical polyps.

"(7) Carcinomatous glands on the pelvic floor or about the iliac vessels. * * *

"(8) In disseminated papillomas in abdomen it is a sine qua non. * * *

"(9) Superficial vulvar blemishes, warts and moles. * * *
"(10) Intravesical bladder tumors. * * *

CONCLUSIONS

"The endothermic conception is as positively and aggressively surgical as the time-honored scalpel, ligature and suture, and tends largely to replace the first two—for centuries the recognized badges of our profession. The fine point of the needle forms such an admirable, delicate, controllable instrument that it makes any surgical knife seem clumsy by comparison.

"Its field par excellence is that of the malignant growth which, by and large, it covers more effectively than any older surgical method. The object is to destroy quickly by heat, within a defined area all the suspected tissues by a perfectly controlled voltage and amperage.

"We are all only too well aware of the awkwardness of putting one operation on top of another in the same area at a later date, and such secondary supplementary operations are rarely satisfactory or thorough on account of scar tissue and hemorrhage. By this new procedure there is no objection to a series of follow-up operations.

"The value of this newer method, which we have tested for the last three years, is that it is quicker and more efficacious and in every way more attractive than our older procedures. It is a sort of long knife and fork manipulation which restrains the operator from direct contacts with the area under treatment. It dispenses largely with the time-honored but always objectionable ligature. With a mild antiseptic dressing the wound is cleaner and heals more quickly and it is usually far less painful. Hemorrhage is greatly lessened and controlled by applying the current to the vessel through the pointed forceps grasping it. *Experto crede.*"

A Preliminary Report of the Results Obtained with Electrocoagulation in Chronic Inflammation of the Cervix Uteri. By G. L. Moench, New York, and A. Schulman, Union City, New Jersey, in *Med. Jour. & Rec.*, CXXXI:3:131, February, 5, 1930. (From the Department of Gynecology, New York Post-Graduate Medical School and Hospital.)

The methods of choice in the treatment of chronic inflammation of the cervix are the actual cautery and electrocoagulation, but in our hands the latter seems to give better results.

Electrocoagulation has certain advantages over the cautery:

It produces less heat in the vagina.

It is more easily controlled.

There is less risk of injury to the soft parts surrounding the cervix.

There is not the odor of burning flesh, as in cauterization.

The resulting slough separates more easily.

There is less tendency to hemorrhage and

Less tendency to stenosis.

Electrocoagulation to us at least appears markedly superior to surgery because no inelastic scar is formed which might cause dystocia in subsequent pregnancies.

As in every form of treatment discrimination must be used.—neither the electrocoagulation nor any other mode of therapy constitutes a general panacea for all cervical lesions.

Diathermy in Gynecology. By G. Kolischer, M. D., Chicago, Ill., in *American J. Obstet. & Gynecol.*, XIX:4:550, April, 1930.

Medical diathermy alone will almost never cure chronic gonorrheal endocervicitis or endometritis, but it is a very powerful support to the routine treatment. The principles of the technic of administering diathermy deserve some discussion. The introduction of an active electrode into the urethra or cervix or uterine cavity is not only apt to produce serious complications but is also entirely unnecessary. Intra-urethral electrification is not only very painful but also apt to produce periurethral abscesses and occasionally perforation of the urethral wall. The intra-uterine administration of high frequency currents is quite often followed by extensive parametritis and perimetritis, the development of ovarian abscesses and pyosalpinx with all the dangers of pelvic peritonitis. It is absolutely unnecessary to take such chances because the intimate apposition of the active electrode to the

urethra, respectively cervix and uterine body, permits the operator to develop within these organs any desired degree of heat.

It must be understood that heat carried closely to the physiologic limit, though not producing coagulation, causes precipitation of the globulins within the cells, thus impairing their vitality.

Another important factor is the length of each seance. With the rising tolerance of the patient this time is progressively extended up to one to two hours.

It may be truthfully asserted that the combination of routine treatment with diathermy and aseptic protein shock, furnishes definite relief in a good many instances of chronic gonorrheal endocervicitis and endometritis that resisted all other therapeutic efforts.

While in chronic parametritis and perimetritis the administration of medical diathermy certainly shortens the time of absorption, the most salubrious effect of this modality is shown in acute and subacute cases of this kind.

Surgical diathermy has a wide field of usefulness in gynecologic work.

Chronically infiltrated periurethral glands and ducts are quickly and definitely obliterated by electrocoagulation with a fine wire.

The destruction of urethral caruncles by electrocoagulation furnishes excellent results.

Electrocoagulation in combination with radiotherapy furnishes definite results in a surprisingly large number of instances.

Surgical Diathermy in Gynecology. By William M. Wilson, M. D., Portland, Ore., in *Medical Sentinel*, 38:5:220, May, 1930.

This author says in part:

Surgical diathermy is especially well adapted for the treatment and eradication of numerous gynecological lesions.

Electro-desiccation and coagulation are the most effective and conservative methods of applying destructive heat. Compared to the actual cautery there is less local and general reaction and less subsequent scarring.

Electro-desiccation may be used advantageously in the treatment of superficial and localized genital lesions.

Electrocoagulation is most effective in the treatment of chronic inflammatory and hypertrophic lesions of the genital tract. It is especially efficacious for the destruction of inoperable and recurrent genital cancers that have not responded to radium therapy.

Indications for the Use of Electro-Surgical Methods. William L. Clark, M. D., Medical Director, Clark Hospital, Philadelphia. Read before the Section of Radiology and Physiotherapy of the Massachusetts Medical Society, Plymouth, June 18, 1930.

The desiccation method is one by means of which benign and malignant growths of small or moderate size may be destroyed by the utilization of heat of just sufficient intensity to desiccate or dehydrate the tissues. The heat is produced by a monopolar high frequency current of the Oudin type, the current being conducted to the lesion by means of a steel needle, or other pointed metallic applicator.

The desiccation method is used advantageously when the lesion is comparatively superficial and localized, and when it is desired to avoid a contracted cicatrix. It is subject to such perfect control, that if the technic is correct, an exceedingly small growth, even on the cornea of the eye can be successfully treated without impairment of vision or the subsequent formation of discernible scar tissue. The desiccation method has been found to be most satisfactory for the treatment of localized epitheliomata or sarcomata occurring upon cutaneous surfaces or accessible mucous membranes. Likewise, it can be employed advantageously in the treatment of such benign lesions as warts, moles, nevus, vasculosis and pigmentosis, angiomata, lupus vulgaris and erythmatosis, certain cases of exostoses, epulis, leukoplakia, papillomata, urethal caruncles, hemorrhoids, infected tonsils, etc.

Coagulation is produced by a bipolar high frequency current of the d'Arsonval type. Either a single or multiple spark gap may be employed, but a good multiple spark gap is preferred by me. The current producing coagulation is more penetrating and intense than that producing desiccation, and in accessible locations is utilized to destroy larger tissue growths, and also where there is extensive bone involvement.

Whether the desiccation or coagulation method is employed, the aim should be to destroy the growth at a single operation. In lesions of the body surface, the devitalized tissue should, as a rule, be removed immediately, either by excision or by curettage, which usually can be accomplished without hemorrhage.

Further Advancement in Gynecological Diathermy. Thomas H. Cherry, M. D., New York, in *N. Y. J. M.*, 30:22:1333, November 15, 1930.

Further pathological conditions of the genital organs due to chronic infections where coagulation diathermy is most useful, are the destruction of infected Skene's glands, urethral follicles and Bartholin's glands. Abscesses of these structures are easily opened by the needle electrode under local anesthesia. The pus is readily evacuated and the opening remains patent 10 days which allows for complete drainage and resolution. This method reduces to a simple office technic, procedure, that with the scalpel and wide incision requires hospitalization and narcosis. In the chronic infective stage of these structures a similar technic utilized will destroy efficiently the infected sites.

As a final topic in advanced diathermy, the subject of malignancy should be discussed.

Present Status of Electrosurgery and Diathermy in the Treatment of Diseases of the Genitourinary Tract. Abraham G. Fleischman, M. D., Des Moines, Iowa, in *Amer. J. Surg.*, x:1:116, October, 1930.

Acute, Subacute, Chronic Prostatitis, and Vesiculitis: A prostatic thermophore is employed, one designed by Elkin P. Cumberbatch of the University of Cambridge, London, England.

The patient is placed in a dorsal position and the dispersing electrode is placed over the suprapubic region. The prostatic electrode is properly lubricated and is introduced in the rectum for a distance of three inches. The current is started and slowly increased up to the patient's tolerance, then slightly reduced. The duration of the initial treatment is about thirty minutes and gradually increased for subsequent treatment until one hour is reached.

I have found diathermy to be of great value in the treatment of acute prostatitis and seminal vesiculitis. Relief of pain, diminution in size of the gland and general systemic improvement have been noted in the patients following the application of prostatic diathermy.

Surgical Diathermy

Urethal Caruncle: The dispersing electrode is placed over the suprapubic region. A mild d'Arsonval current is used and electrocoagulation is performed by inserting the point of a Turner or Timberlake endoscopic electrode into the base of the growth in one or several places.

Tumors of the Bladder: The advantages of diathermy in the management of bladder tumors are many:

The treatment can be made bloodless;

The danger of metastasis and recurrences is minimized because of the destuction of the tissue cells below the level of those which have been removed.

Bladder deformity with its associated decrease in size is obviated to a considerable extent.

The Utilization of Electro-Coagulated Tumour Tissue in Histological Diagnosis. G. Bostrom in *Acta Radiol.* XII:66:185:15:IV, 1931.

In surgical electroendothermal work three different procedures are recognized.

1. Monopolar application or desiccation.
2. Electrotomy by means of one knife- or needle-shaped active electrode and one large flat passive electrode.
3. Electrocoagulation by means of either two flat or ball-shaped active electrodes of equal size or one small active and one large passive electrode.

The present investigation is limited to a study of the possibilities of arriving at a correct microscopical diagnosis in the examination of tumor tissue which has been subjected to electrocoagulation.

Microscopical diagnosis is possible if a biopsy is performed immediately after coagulation. A suitable piece of the coagulated tumour is removed.

At Radiumhemmet where electroendothermy was introduced in 1922 by Dr. Berven, electrocoagulation is nowadays employed in the treatment of carcinoma of the vulva, of malignant tumours of the mouth (ca. linguae, ca. buccae, ca. gingivae) and of certain naevi and skin carcinomas.

With the object of getting a general idea of how far electrocoagulated tissue lends itself to histological diagnosis I have collected about a hundred cases of electrocoagulated tumours, which I have had the opportunity of studying in the pathological department of Radiumhemmet.

In electrocoagulated tissue it is generally noticed that the cells are indistinctly outlined, the nuclei shrunken and the blood vessels sometimes obliterated, sometimes filled with blood; the tissue spaces are wide and filled with coagulated tissue fluids.

With the object of comparing the effect of electrocoagulation with coagulation by heat under different though similar conditions I have heated a piece of tissue from the vulva in water at 80C. for twenty minutes and this was afterward fixed as usual. The specimen shows marked shrinkage and partial detachment of the surface epithelium. The tissue spaces in the subcutaneous connective tissue are filled with coagulated tissue fluids and the cells are shrunken. Deeper down these changes are less well marked.

As a rule electrocoagulation does not produce such changes in the tissues as to render a microscopical diagnosis impossible. In our series this has happened in four cases only out of eighty-four, i.e., in about 5 per cent.

The author's investigation has shown that, as a rule, it is possible to obtain a microscopical diagnosis on a biopsy from an electrocoagulated tumour although the structure has to some extent been altered by previous treatment. Thus, in cases subjected to electrocoagulation it is unnecessary to perform a preoperative biopsy unless the clinical diagnosis is doubtful and difficulties in the histological interpretation of the case can possibly be expected.

Electrosurgery in Diseases of the Genito-Urinary System. Edward L. Keyes, M. D., F. A. C. S., New York, in *Surg. Gynec. & Obstet.*, 552:2A:515, February, 1931.

And, finally, it is doubtless well known that electrocauterization is the preferable destructive agent for cysts, papillomata, and granulomata, whether of the skin, of the preputial cavity, or of the urethra. It is equally to be preferred as the convenient agent for attacking obstinate and phagedenic chancroids, as well as granuloma inguinalis which does not yield promptly or completely to antimony.

Electrothermic Hemorrhoidectomy: David Warshaw, M. D., F. A. C. S., Albany, N. Y., in *Amer. J. Surg.*, XI:1:45, January, 1931.

Summary

Over 200 cases have been operated upon in this manner. Compared with other methods, the following advantages are claimed for it:

1. Under suitable circumstances, it may be done in the office.
2. There is no blood loss.
3. No complications such as fissures, ulcers, infections, abscesses, strictures, or loss of sphincter control have occurred.
4. No recurrences have been observed after this method was used during the past four years.
5. Convalescence is shorter and more comfortable. Total disability rarely exceeds four days.

Cure of Large Carcinomatous Tumor of Bladder by Means of Electrocoagulation. Abstract in Jour. A. M. A., 96:20:1745, May 16, 1931, from *Zent. f. Gynak.*, 55:338, Feb. 7, 1931.

Goedecke reports the clinical history of a woman, aged 48. For ten years she had had disturbances of the bladder and occasionally the urine had contained blood. When the vesicle hemorrhages became more frequent and more profuse and also on account of severe pains during the discharge of the urine, the woman came to the clinic. Attempts to stop the hemorrhage failed. Palpation revealed a large tumor in the bladder and cystoscopic examination disclosed that the capacity of the bladder was extraordinarily small and that the floor was completely covered with a tumor. Results of a biopsy indicated a papillary

tumor with carcinomatous proliferation. A functional test of the kidneys revealed almost normal conditions, and visualization of the urinary passages by means of iopax showed likewise normal conditions. The author considers the latter diagnostic method especially valuable, because the treatment has to be different if the vesicle tumor obstructs the ureters and causes disorders of the kidneys, pelvis and ureters than if only the bladder is involved. After the pathologicoanatomic conditions and the clinical aspects were completely understood, electrocoagulation of the tumor was begun. In thirteen treatments, which were given in the course of three and one-half months, the tumor was completely destroyed. The total number of minutes during which the electric current had been applied to the tumor was sixty-three and the strength of the current was 0.1 ampere. Six months has passed since the last treatment and repeated control examinations have proved that the tumor has entirely disappeared and only a fine scar remains. A cystitis no longer exists, and the urine is clear and free from pathologic elements. In the course of the treatment it had become clear that the growth was a pedicled adenomatous carcinoma. On account of its malignant character, high voltage roentgen irradiations were given in addition to the local electrocoagulation. After experiences in this case the author agrees with several other workers, who have had a wider experience with electrocoagulation of tumors of the bladder, that this method is to be preferred to all other therapeutic measures.

One Thousand Gynecologic Cases in Which Diathermy Was Employed. Abstract in Jour. A. M. A., 95:21:1625, Nov. 22, 1930, from *Arch. d. Ostet. e Ginecol.*, Naples, 17:536, August, 1930.

Buben regards diathermy as a valuable therapeutic aid in many gynecologic cases and particularly in inflammatory disorders of the true pelvis, in which, in addition to effecting an improvement of the pain symptoms, there is sometimes a shrinking of the inflammatory tumor or even its complete disappearance. Other indications for diathermy are gonorrhea in women, especially if it is combined with other bactericidal treatment; also bladder disorders. It may be employed also to increase the sensitiveness of the tissues to rays in the treatment of cancer; also for diagnostic purposes to decide whether or not an inflammatory tumor of the adnexa is operable.

Uses of Diathermy in Medicine and Surgery. E. P. Cumberbatch, M. B., Oxf., M. R. C. P., Lond., D. M. R. E., Medical Officer in charge of electrical department, St. Bartholomew's Hospital; in *Lancet* (London) 1:4:Feb. 7, 1931.

Gynecology

It is in the treatment of certain diseases peculiar to women that medical diathermy has achieved the most striking success. By means of a suitable method the urethra and cervix can be safely and painlessly heated to a temperature of 114 degrees F., or nearly a degree higher. The object of heating them to this high temperature is to aid them in freeing themselves from infection. This treatment is given twice weekly during one or two intermenstrual periods. Its effect is to remove all clinical signs of inflammation. If the infection is gonococcal the organisms disappear. The streptococcus haemolyticus also disappears. Diphtheroid and coliform bacilli and non-pyogenic streptococci and staphylococci, if present in the cervical secretion, sometimes persist after diathermy even though all signs of cervicitis disappear.

The results above mentioned were obtained in 90 per cent of gonococcal cases and in 80 per cent of non-gonococcal cases. The patients were followed up for two years, and the results were found to be permanent. The cases in which the treatment failed include those in which relapse occurred at later stages after apparent cure. Failure occurred in those cases where there was widespread infection of the pelvic supporting tissues. The relatively minor degree of therapeutic pyrexia that can be produced in the tubes is very often successful in bringing salpingitis to an end, both in gonococcal and non-gonococcal cases.

General pelvic diathermy is very successful in dysmenorrhea due to a minor degree of salpingitis. On the other hand, the treatment has no permanent effect in cases of dysmenorrhea of the spasmodic type. Patients say they are much better during the period after the first course of diathermy, but if further courses

are given they say that their improvement is not maintained. Ultimately they return to their original condition.

General pelvic diathermy seems to influence the endocrine functions of the ovaries. If cessation of menstruation is premature, this treatment will frequently cause its return, even though it may have been absent for one, two, three or more years. In one case it returned after ten years' absence. Another fact which seems to indicate the influence of diathermy on the endocrine functions of the ovaries is the cessation of climacteric bleeding during the treatment and the alleviation of the symptoms which sometimes occur prior to the change of life.

Before concluding my observations on diathermy in gynecology I should like to call your attention to the work of Dr. Robinson in the treatment of puerperal fever by the same agent. By means of intrapelvic diathermy he succeeded in curing thirty-three out of thirty-nine cases. This work is entirely original. As far as I am aware, no other method has been so successful. The usual prophylactic precautions were taken, and diathermy was not applied in any case before the fever had been in existence for seven days. Dr. Robinson has communicated his results to the Hunterian Society and to the Section of Electrotherapeutics of the Royal Society of Medicine.

Most of the cases of gonococcal prostatitis and vesiculitis which I have had under my care or observation have responded satisfactorily to diathermy. The treatment was applied by way of a rectal electrode. Cases in which the gonococci could not be made to disappear from the secretion under other forms of treatment were no longer found after diathermy.

In regard to anterior urethritis the action of diathermy is disappointing.

My own experience of diathermy in senile enlargement of the prostate is mainly restricted to that of a few cases in old men who were unfit for surgical operation. I treated them by medical diathermy, but it is doubtful whether they derived any benefit. Quite recently, however, I have had three cases in men aged 60, 63 and 60, respectively. In these cases the symptoms of obstruction were naturally of long duration. The patients complained of difficulty in emptying the bladder on rising in the morning, and of the necessity of getting up at night to micturate. Diathermy removed these symptoms. One patient has been free for three months, another for the same length of time and the third for sixteen weeks. It is possible that the obstruction in these cases was due to congestion of the enlarged prostate. Diathermy would be expected to remove it.

Gonococcal Arthritis

In the treatment of this type of joint disease it is imperative that the prostate and vesicles (in men) and the cervix uteri (in women) should be subjected to the diathermy. It is not necessary to apply it to the joints themselves. This form of treatment brings the arthritis to an end, and it does so—in my experience—invariably.

There is another variety of arthritis in women which responds well to pelvic diathermy. I refer to the type which is recognized by some workers and named menopausal arthritis. It occurs just after, or a little before, the cessation of menstrual life. The menopause may, in fact, be premature. The patients say they have increased in weight or become stouter. On examination it is found that there are pads of tissue resembling fat just above the knees and in the upper arms. It is in the knees that pain is often felt. In these joints synovial membrane is thickened. The treatment of this type of arthritis by pelvic diathermy relieves the pain and causes the disappearance of the pads above mentioned. If the cessation of menstruation is premature the return of the periods is often observed by the patient. These facts have led my co-worker, Dr. Robinson, to formulate the theory that this type of arthritis is due to disturbance of the endocrine function of the ovaries. He has an interesting collection of cases of this kind at the London Clinic.

Diathermy of Testis and Epididymis: Technic. Abst. in Jour. A. M. A., 95:4:311, July 26, 1930. *Ztschr. f. Urol.*, 24:342, 1930.

In the treatment of gonorrheal epididymitis and impotence, Kowarschik has obtained good results with diathermy of the testis and epididymis. The patient is placed on his back and a large lead plate, which serves as the indifferent electrode, is placed

under the buttocks. The scrotum is then drawn upwards by means of a towel and the external genitalia are passed through an opening in a piece of rubber dam that is used to isolate, electrically, the scrotum from the rest of the body. This prevents the passage of the current in any other way than through the scrotum. A metal gauze electrode of silvered alpaca 14 by 14 cm. is then dipped in ordinary warm water or in soap water and spread over the scrotum. Great care should be taken in applying this electrode that its edges rest on the rubber dam and nowhere come in contact with the skin of the inguinal region or of the thigh, because if it does the result will be a burn. With this technic the author has obtained good results in the treatment of gonorrheal epididymitis and impotence.

Diathermy of the Rectum and Pelvic Colon (Preliminary Report). By Horace W. Soper, M. D., St. Louis, Mo., in *Jour. Mo. M. A.*, 27:6:263, June, 1930.

The rectum is an ideal field for the employment of electrocoagulation. It is devoid of sensory nerves excepting in the anal canal; above this region no anesthetic is required. Moreover, it is open to inspection and repeated treatments.

Polypi—The ordinary small pedunculated mucous polyp is best removed by the snare or guillotine. The polyp that presents a roughening or cauliflower-like projection at its apex should be destroyed by monopolar diathermy. The non-pedunculated polyp should be sparked by the bipolar method thus assuring deeper penetation beyond the base. This is particularly true of those nodular polyps that so frequently develop in cases of ulcerative colitis.

Papillomata—One should begin very gradually and spark but a small area; later the patient develops a tolerance and larger areas may be attacked. These growths exhibit a strong tendency to recur and the patient must be kept under observation for months afterward.

Carcinoma—Adenocarcinoma is by far the most frequent growth encountered in the rectum and pelvic colon. Eight such growths have been destroyed by diathermy without recurrence in the past three years. Diathermy is far preferable to surgery in this early type of cancer.

The annular type of growth should not be attacked by diathermy.

Tuberculous Ulcer—Simple ulcers heal very quickly after treatment by monopolar diathermy. The tuberculous ulcer involving the anal canal responds well to the bipolar method.

Conclusions

Diathermy is the treatment of choice in precancerous polyps, early cancer that projects into the lumen of the gut, and in simple and tuberculous ulcers of the rectum and pelvic colon. In later inoperable cancer the visible growth may be destroyed and bleeding checked.

Some Useful Office Procedures in Gynecological Therapy. From the Department of Gynecology, New York Post-Graduate Medical School and Hospital. By Water T. Dannreuther, M. D., Professor of Gynecology and Director of the Department, New York Post-Graduate Medical School and Hospital, in *New England J. M.*, 203:8:351, August 21, 1930.

Read before the Section of Obstetrics and Gynecology, Mass. Medical Society, Plymouth, Mass., June 17-18, 1930.

Intracervical Galvanism—The negative pole of the galvanic current, applied to the uterine muscle covered with a mucous surface, promotes glandular secretion, relaxes muscle fibres, and stimulates circulatory activity. I have utilized it for many years in the treatment of cervical stenosis, anteflexion, and uterine hypoplasia. Using 6 to 12 milliamperes of current and increasing the size of the electrodes from time to time, the cervix can be gradually and painlessly dilated without trauma.

Cauterization of the Cervix—Cases that resist cauterization and those that are complicated by obstinate infection of the endocervical glands can be satisfactory treated with surgical diathermy.

Surgical Diathermy—Dr. Hyams has devised an instrument whereby the entire endocervical mucosa and glandular structures can be coned out, with minimum destruction of uninvolved tissue, preservation of the musculature, and without subsequent bleeding.

It consists of a platinum iridium wire attached to a silicon tube 1½ inches long, on an insulated shaft. An indifferent electrode is placed on the moistened abdominal skin and held firmly in position. Starting just outside the external os with the current turned on, the instrument is passed slowly into the cervical canal to the internal os, and the mucous membrane cored out with a twist of the wrist.

Medical Diathermy—The discomfort arising from adnexitis, parametritis, and pelvic adhesions is quickly relieved. I would also utter a word of caution concerning its use in the presence of active or latent tubal infection.

Conservative Treatment of Gonorrheal Epididymitis with Special Reference to the Therapeutic Value of Diathermy. By Herman H. Goldstein, M. D., Department of Urology, City Hospital, Newark, New Jersey, in *Urol & Cutan. Rev.*, 34:3:146, March, 1930.

The patient with gonorrheal epididymitis is immediately put at rest in bed. The scrotum is supported by the very simple expedient of strapping a piece of adhesive plaster across the thighs. The adhesive which is about six inches in width is strapped close to the perineum and a small cotton pad makes a snug pillow for the scrotum. Heat in the form of hot wet dressings, but more often in the shape of a hot water bottle is used as a continuous application and the patient is given one to three hot Sitz baths daily for one-half to one hour at each sitting. Beginning with the day of admission and daily thereafter, the patient is given diathermy treatments. This we considered not an adjunct to the treatment but an integral part of it. We use as electrodes, a large piece of sheet lead about 8 x 8 inches in size which is moistened with green soap to obtain better contact and placed under the buttocks, and a smaller piece of the same material about 3 x 5 inches in size which is moulded about the swollen part and held in place by the patient. It has been our observation that the results obtained with these large electrodes are superior to those seen when using the small testicular clamp which is on the market.

In the past year we have seen at the Newark Hospital seventy cases of acute gonorrheal epididymitis. Of this series only one epididymotomy was necessary.

Electrosurgery in the Treatment of Uterine Cervical Lesions. By Frank M. Mikels, M. D., Los Angeles, in *American Jour. Surg.* vii:6:818, Dec., 1929. (Submitted for publication May 31, 1929.)

Electrosurgery is the most conservative method for the treatment of uterine cervical lesions.

Electrosurgery is more efficacious in treating erosions and chronic infections of the cervix than any other method.

Electrosurgery destroys infection and produces an end result which does not impair the function of the musculature of the cervix.

Electrosurgical methods of treating the chronic Neisserian infection have proved reliable.

The final result of extensive coagulation of cervical erosions complicated with lacerations do not interfere in any way with successful plastic operations for repair but leave a clearer and cleaner field for this procedure.

Electrosurgical Gynecological Office Procedures. By Grant E. Ward, Baltimore, in *American Jour. Surgery*, 8:2:379, February, 1930.

Urethral caruncle and redundant urethral mucosa—In treating either condition a local injection of 1 per cent or 2 per cent novocaine is first made inclosing a wide margin beyond the disease, frequently requiring injection all way around the urethral orifice. The caruncle is excised with a strong cutting-coagulating current.

Redundant mucosa is quickly destroyed by applying the monoterminal heating current directly to the surface using a sharp needle electrode.

A thin flat electrode, ½ inch long and ⅛ inch wide, is placed in direct contact with the mucosa. A slow biterminal current is preferred as the entire depth of the mucosa should be destroyed.

Venereal warts—Local anesthesia is necessary here. The warts dry up quickly under the application of a monoterminal desiccating current.

Cysts—Bartholin's glands cysts are opened with the cutting current with very little or no bleeding.

Infections in Skene's and Bartholin's glands, causing recurrent infections in the urethra and cervix. A long, thin needle is inserted to the depth of the gland, the current turned on and continued until the tissues adjacent are blanched, indicating dehydration.

Endocervicitis—In the more mild cases the canal and external os is cleaned up with a biterminal current under local anesthesia.

Polyps—Small vaginal or cervical polyps are readily destroyed with a short thick monoterminal current.

Hemorrhoids—It should be noted in passing that large internal and external hemorrhoids can be dehydrated (desiccated) under local anesthesia in the office.

One or two hemorrhoids require only local injection about them whereas multiple ones necessitate injections around the anus and up above the internal sphincter. The sphincter muscle is then dilated, releasing the spasm, which causes the hemorrhoid. A desiccating monoterminal current of short thick spark is preferable being applied by a suitable needle electrode. The needle is thrust into the hemorrhoid and allowed to remain until the blood is dehydrated sufficiently by the clot.

Larger hemorrhoids require clamping with any suitable hemostat stagnating the blood rendering dehydration and clotting more prompt.

Electrosurgery in Gynecology. Dr. Howard A Kelly, Baltimore, at the 42nd annual session of the Southern Surgical Association held at Atlanta, Ga., Dec. 10-12, 1929; *Jour. A. M. A.*, 94:4:287, Jan. 25, 1930.

In general surgery, the field for the new agent electrosurgery is a wide and most beneficient one, adding enormously, in some of his most difficult fields, to the efficiency of the surgeon and his delight in his work. In gynecology, it is an indispensable agent for the following reasons:

1. It is far cleaner than are previous methods and sterilizes as it proceeds.

2. It is a working at a distance knife and fork procedure, as it avoids all handling of the structures.

3. It checks the hemorrhage of the smaller vessels and gives a better continuously visible field.

4. An active hemorrhage can usually be checked at once by catching the vessel delicately and turning on the current, which seals it effectively.

5. Ligatures are largely avoidable, in this way saving much time.

6. Nice work can often be done at a distance, say, deep in the pelvis, as easily as near the surface.

7. Pari passu as the operation proceeds the lymphatics are sealed.

8. It is invaluable in destroying any lingering infected area or disseminated malignant growth which cannot be dissected out.

9. As a method of doing a refined dissection it is admirable.

10. If we had always been accustomed to depending on electrical surgery and some iconoclast were to invent the scalpel, ligatures and sutures with their oft-accompanying manipulations of the tissues, we would at once reject these novelities as being markedly inferior in every way, enhancing the risks both of mortality and of morbidity to the patient. Where usable, this method is as much ahead of scalpel surgery as our powerful modern electric engines are ahead of Richard Trevithick's and George Stephenson's locomotives.

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